Remarks

Claims 10 – 14, 20, and 21 are pending. Claim 14 has been withdrawn but is subject to rejoinder. Claims 15 – 18 have been cancelled without prejudice. Favorable reconsideration is respectfully solicited.

Claims 15 – 18 had been objected to and also rejected under 35 U.S.C. § 112. To expedite prosecution and to simplify issues on appeal should appeal be necessary, these claims have been cancelled without prejudice to later filing these claims in a continuation application. The objections and rejection of these claims is hence moot.

Claims 10 – 13 and 20 – 21 have been rejected under 35 U.S.C. §§102(a) and (e) over Gottschalk-Gaudig et al. U.S. 7,541,405 ("*Gottschalk-Gaudig*"). See paragraph 11 of the Office Action on pages 7 – 9. Claims 10 – 13 and 20 – 21 have also been rejected under 35 U.S.C. § 102(a) or § 103(a) over the European equivalent of Gottschalk-Gaudig, EP 1 526 153. See paragraph 12 on pages 9- 10 of the Office Action.

On page 13 of the Office Action, paragraph 20, the Office states that Applicants have not perfected their claim to priority. This is incorrect. Please note the discussion on page 14 of Applicants' response dated July 30, 2010, and the English translation of the certified copy of the Germany priority document attached thereto. This document is also in the electronic file, with a mail room date of August 2, 2010, labeled "specification." In Applicants' response, it was indicated that the translation of the certified copy of the priority document was accurate, which is all that is required per 37 C.F.R. § 1.55 and the latest revision of the MPEP, in contrast to the old practice where a certified translation of the certified copy was required. As Applicants have perfected their right to their German priority date of March 25, 2004, the rejections over *Gottschalk-Gaudig* and its European equivalent should have already have been withdrawn. Their withdrawal is thus respectfully solicited.

Claims 10 – 12 and 20, 21 have been rejected under 35 U.S.C. §§ 102(b) and 103(a) over Barthel et al. U.S. published application 2003/0175317 A1 ("*Barthel*"). Applicants respectfully traverse these rejections.

Barthel discloses w/o/w and o/w/o multiple emulsions prepared by dispersing silica in an oil phase and then dispersing this oil phase in water. *Barthel* is silent regarding the surface energy gamma of his particles, and the form factor, both of which are claim requirements, and on the basis of which the corresponding EP patent has been examined and granted.

Anticipation requires "strict identify." *Trintec Corp. v. TOP-U.S.A. Corp.*, 63 USPQ2d 1597 (Fed. Cir. 2002). Here, since these limitations are not disclosed, nor are they inherent, *Barthel* does not anticipate the claimed subject matter, and the rejection over *Barthel* should be removed for this reason.

Barthel also does not disclose the limitation that the claimed emulsions are stable with respect to creaming, or the relative viscosity limitation, nor are these inherent. The HDK H30 silica used by *Barthel* and referred to by the Office is a hydrophobic silica which cannot be dispersed in water. Attached are pages from a product brochure on HDK silicas which attest to this fact, which is well known in the art.

As indicated in the Declaration of Dr. Gottshalk-Gaudig, the method of preparation used by *Barthel*, even when a partly hydrophobic (water-wettable) silica is used, does not result in stable emulsions. See paragraph 4 and Examples 1 and 2 of the Gottschalk-Gaudig Declaration. The stable emulsions of the invention must be prepared by the claimed process (claim 14, claim 20). This process cannot be used with hydrophobic silica such as HDK H30 because the process requires first forming a highly concentrated dispersion of silica in the aqueous phase which cannot be done with HDK H30 since this silica cannot be dispersed. Applicants' process is a three step process which is not disclosed, taught, or suggested by *Barthel*, and Applicants have shown that when this process is not used, no stable dispersion results. Thus, *Barthel* does not inherently produce the claimed emulsions.

Barthel also does not teach or suggest the claimed emulsions. There is no teaching or suggestion to use Applicants' process, and this process is necessary to produce the claimed emulsions. The o/w and w/o dispersions of *Barthel* are only intermediates in his preparation of o/w/o and w/o/w emulsions, and there is no need for the intermediate o/w and w/o emulsions to be stable, since they are immediately finely dispersed in the o phase or w phase, respectively. *Barthel* never indicated that these intermediate o/w and w/o dispersions were stable against creaming, only that they were stable enough for preparation of the ultimate multiple emulsion product, and Applicants have shown in the Gottschalk-Gaudig Declaration that they are <u>not</u> stable with respect to creaming. The multiple emulsions are stable. Note that the smallest particle sizes disclosed by *Barthel* (see Figure 1b) is about 27 μm, whereas in the dispersions of Applicant, the particle sizes are much smaller, *e.g.* 3.5 to 7.7 μm (see Table 3). These small particle sizes are what is responsible for stability against creaming, and cannot be obtained by the process of *Barthel*.

Withdrawal of the §§ 102(b) and 103(a) rejections over *Barthel* is respectfully solicited.

Claims 10 – 11 and 20 – 21 have been rejected under 35 U.S.C. §§ 102(b) and 103(a) over Binks et al. Langmuir 2000 I ("*Binks I*") Applicants respectfully traverse this rejection.

Binks I (Binks is a coinventor) is a scholarly article dealing with the use of silica to form o/w and w/o emulsions. To do so, *Binks* requires two silicas, one hydrophobic and not dispersible in water (HDK H30) and one which is hydrophilic and water dispersible (HDK N20, an untreated fumed silica). Contrary to the statement of the Examiner, there is no evidence that HDK H30 has the surface energy gamma or form factor required by the claims. The residual silanol groups, carbon content, contact angle, surface gamma, and form factor are all independent variables with respect to silica and can be varied over a very wide range, substantially independently of each other, as is well known to those skilled in the art.

Binks I does not disclose the process of Applicants, but uses the same dispersion process taught by *Barthel*. Applicants have shown that the *Barthel* process does

not result in o/w or w/o dispersions which are stable to creaming, and the Examples of *Binks* bear this out. The *Binks I* dispersions exhibited marked coalescence and creaming, even after only 30 minutes. Such emulsions could not even make it to the door of the manufacturing facility before they become separated and commercially worthless. This is also evident from Figure 4, which shows that the *Binks I* dispersions with monomodal particle size distributions had large particle sizes, with mean diameters of about 30 – 60 μm. The bimodal distributions had particles in the range of about 1 μm, but a significant fraction with diameters of 10 μm to greater than 100 μm (0.1 mm). These compositions are not stable to creaming.

Binks I does not disclose, nor does he teach or suggest the claim limitations, nor are these inherent. *Binks I* only discloses unstable dispersions prepared by an entirely different process. *Binks I* is also non-enabling, because he does not disclose, teach, or suggest any process which can be used to prepare emulsions stable against creaming. A non-enabling reference cannot be used in rejecting the claims.

Withdrawal of the rejections of the claims over *Binks I* is respectfully solicited.

Claims 10 – 13 and 20 – 21 have been rejected over Barthel U.S. 5,686,054 ("*Barthel II*). Applicants respectfully traverse this rejection. The silicas employed by *Barthel II* are <u>highly</u> apolar silicas, prepared by a special method of hydrophobicization. Starting materials may be completely hydrophilic silica, *e.g.* HDK N20, or already hydrophobicized silica, e.g. HDK H20. The drastic hydrophobicization renders these silicas highly effective in increasing the viscosity of <u>apolar</u> liquids. However, they, like ordinary hydrophobic silicas such as HDK H30, are not dispersible in aqueous phases. See column 22, lines 53 – 55. Thus, these silicas cannot be used in the process of Applicants.

Barthel never even made any o/w or w/o dispersions. All his compositions have but a single phase, an oily or apolar phase. *Barthel II* does not disclose, teach, or suggest Applicants' claimed invention, nor does he enable it. Rather, *Barthel II* teaches against the claimed invention by hydrophobicizing silica so much that <u>no</u> surface silanol groups remain. See column 1, lines 44 – 48, which describes the object of *Barthel II* to

eliminate all silanol groups by complete silylation. Applicants' silicas must contain surface silanol groups.

Withdrawal of the rejection of claims over *Barthel II* is respectfully solicited.

Claims 10 – 12 and 20 – 21 have been rejected under 35 U.S.C. § 103(a) over *Binks I* in view of *Binks II*.

Binks II, like *Binks I*, is silent regarding the surface gamma and form factor. *Binks I* also does not employ the process of Applicants to prepare emulsions, but employs the method of *Barthel*, which Applicants have shown cannot prepare stable emulsions. As shown in Figures 7 and 8, the emulsions rapidly separated into oil phases and polar phases. *Binks II*, whether alone or in combination with *Binks I*, does not enable the claimed invention. Withdrawal of the rejection over *Binks I* in view of *Binks II* is respectfully solicited.

Applicant submits that the claims are now in condition for Allowance, and respectfully request a Notice to that effect. If the Examiner believes that further discussion will advance the prosecution of the Application, the Examiner is highly encouraged to telephone Applicant's attorney at the number given below.

Please charge any fees or credit any overpayments as a result of the filing of this paper to our Deposit Account No. 02-3978.

Respectfully submitted,

Torsten Gottschalk-Gaudig et al.

By
William G. Conger, Reg. No. 31,209
Attorney/Agent for Applicant

Date: January 28, 2011

BROOKS KUSHMAN P.C.
1000 Town Center, 22nd Floor
Southfield, MI 48075-1238
Phone: 248-358-4400; Fax: 248-358-3351

WACKER SILICONES

HDK®

PRODUCT OVERVIEW
HDK® – PYROGENIC SILICA

CREATING TOMORROW'S SOLUTIONS

A SURVEY OF HDK® PRODUCT DATA

Hydrophilic HDK®

Hydrophilic HDK® is manufactured by the hydrolysis of volatile chlorosilanes in an oxyhydrogen flame. In chemical terms, it consists of highly pure amorphous silicon dioxide with the appearance of a fluffy white powder. Hydrophilic silica is wetted by water and can be dispersed in water.

Hydrophobic HDK®

Hydrophobic HDK® is produced by the chemical reaction of hydrophilic HDK® with reactive silanes, e.g. methyl chlorosilanes or hexamethyldisilazane. It has water-repellent properties and is no longer dispersible in water.

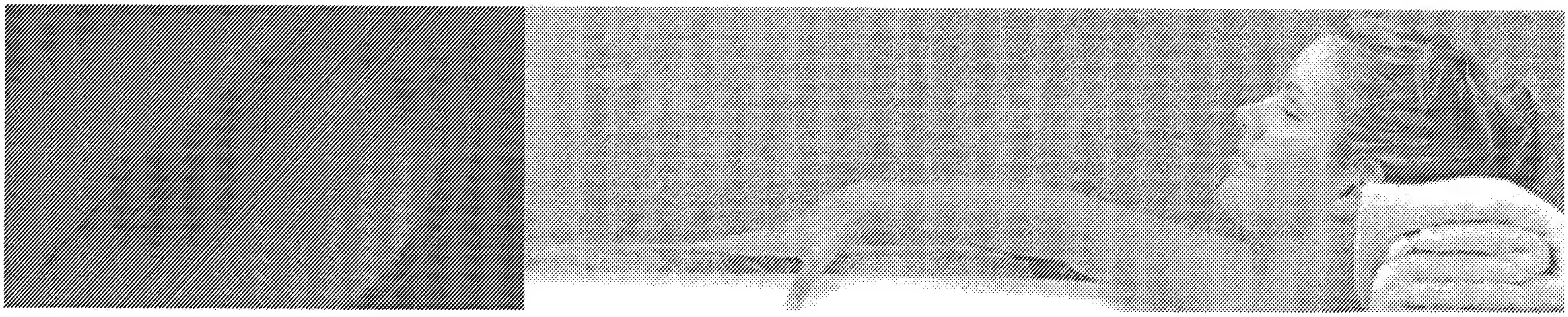
HDK® Dispersions

HDK® dispersions are produced by the dispersion of hydrophilic HDK® in water using high shear forces. They obtain their stability by electrostatic and steric stabilization.

Typical General Properties		
Appearance		Fluffy white powder
Crystal structure of SiO_2		Amorphous
SiO_2 content[1] DIN EN ISO 3262-19	[wt. %]	> 99.8 %
Loss on ignition[2] DIN EN ISO 3262-19, at 1,000 °C/2 h	[wt. %]	< 2 % (hydrophilic)
Density of SiO_2 DIN 51757	[g/cm³]	approx. 2.2
Refractive index		1.46 (hydrophilic)
Silanol group density		2 SiOH/nm² (hydrophilic)

1 Based on the substance incinerated for 2 h at 1,000 °C
2 Based on the substance dried for 2 h at 105 °C

HDK®: MANIFOLD APPLICATIONS



HDK® Hydrophilic Grades – Physico-chemical Properties

HDK®		D05	C10	C10P	S13	S13P	V15	V15P	N20	N20P	N20ST	N20 Pharma	T30	T30P	T40	T40P
BET surface area DIN EN ISO 9277/DIN 66132	[m²/g]	30-70	80-120	80-120	110-140	110-140	130-170	130-170	170-230	170-230	170-230	170-230	270-330	270-330	360-440	360-440
pH in 4 % dispersion DIN EN ISO 787-9		3.8-4.8	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3	3.8-4.3
Tamped density DIN EN ISO 787/11	[g/l]	ca. 50	ca. 50	ca. 100	ca. 50	ca. 100	ca. 50	ca. 100	ca. 40	ca. 100	ca. 40	ca. 40	ca. 40	ca. 100	ca. 40	ca. 100
Loss on drying, ex works (2 h at 105 °C) DIN EN ISO 787-2	[wt. %]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5	<1.5
Sieve residue DIN EN ISO 787-18	[wt. %]	<0.1	<0.05	<0.03	<0.03	<0.03	<0.03	<0.03	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04

Note: These figures are intended as a guide and should not be used in preparing specifications.

HDK® Hydrophobic Grades – Physicochemical Properties

HDK®		H13L	H15	H20	H30	H17	H18	H2000	H20RM	H30RM
BET surface area of hydrophilic silica DIN EN ISO 9277/DIN 66132	[m²/g]	110–140	130–170	170–230	270–330	130–170	170–230	170–230	170–230	270–330
BET surface area of hydrophobic silica DIN EN ISO 9277/DIN 66132	[m²/g]	ca. 110	ca. 120	ca. 170	ca. 250	ca. 90	ca. 120	ca. 150	ca. 150	ca. 200
pH in 4 % dispersion (1 : 1 mixture of water – methanol) DIN EN ISO 787-9		3.8–4.8	3.8–4.8	3.8–4.8	3.8–4.8	4.0–6.2	4.0–6.8	6.5–8.0	6.5–7.5	6.5–7.5
Tamped density, DIN EN ISO 787/11	[g/l]	ca. 70	ca. 40	ca. 40	ca. 40	ca. 50	ca. 50	ca. 200	ca. 50	ca. 50
Loss on drying, ex works (2 h at 105 °C) DIN EN ISO 787-2	[wt. %]	<0.5	<0.6	<0.6	<0.6	<0.5	<0.5	<0.8	<1.0	<1.5
Sieve residue DIN EN ISO 787-18	[wt. %]	<0.05	<0.05	<0.05	<0.05	<0.2	<0.2			
Carbon content DIN EN ISO 3262-20	[wt. %]	ca. 1.5	ca. 1.0	ca. 1.4	ca. 2.0	ca. 4.5	ca. 4.5	ca. 2.3	ca. 3.0	ca. 4.0
Surface modification		Dimethyl-siloxy	Dimethyl-siloxy	Dimethyl-siloxy	Dimethyl-siloxy	Polydimethyl-siloxy	Polydimethyl-siloxy	Trimethyl-siloxy	Trimethyl-siloxy	Trimethyl-siloxy
Residual silanol content (relative silanol in relation to the hydrophilic silica, which shows approx. 2 SiOH/nm²)	[%]	50	50	50	50	25	25	25	25	25

Note: These figures are intended as a guide and should not be used in preparing specifications.

HDK® Dispersions – Physicochemical Properties

		D1515B	D2012B	A2012	A3017	XK20030
BET surface area silica DIN EN ISO 9277/DIN 66132	[m²/g]	150 ± 20	200 ± 30	200 ± 30	300 ± 30	200 ± 30
Solids content	[%]	15	12	12	17	30
pH		4–6	4–6	8–10	8–10	9–11
Viscosity	[mPa s at 200 s⁻¹]	<100	<100	<100	<100	<100
Zeta potential	[mV]	<-10	<-10	<-10	<-10	<-10

Note: These figures are intended as a guide and should not be used in preparing specifications.